

**ABSTRACT**

An arrangement for a direct methanol fuel cell includes a fuel cartridge that supplies a source of fuel to the direct methanol fuel cell. The fuel cartridge has a surface area enhanced planar vaporization membrane residing in the fuel cartridge. The arrangement also includes a fuel reservoir that receives fuel from the fuel cartridge, the fuel reservoir arranged to deliver fuel to the fuel cell. The fuel reservoir also including a surface area enhanced planar vaporization membrane residing in the fuel reservoir. The combination of the surface area enhanced planar vaporization membranes residing in the fuel cartridge and reservoir provides a dual stage vaporization of fuel to the fuel cell. Other features included are passive or active arrangements to increase the temperature of the fuel or reduce pressure in the fuel container to enhance rate of vaporization.

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